Inventions & Innovation Project Abstract

Medium Voltage Energy Saving Motor Controller

Power Efficiency Corporation (PEC) is validating the concept and technical feasibility of a medium voltage electric motor controller that cost-effectively reduces energy consumption by up to 35% for underloaded medium voltage (2300-4600 V) electric motors. While large electric motors comprise only 0.3% of the number of motors used in U.S. manufacturing, they consumer 19% of the total motor energy. When a motor is loaded less than 40% of its full load (i.e., "underloaded"), its efficiency declines quickly. Up to 40% of industrial motors over 200 HP operate at less than 40% of full load.

The potential energy savings are significant, and are estimated at 75 x 10^{12} (trillion) Btu per year. This represents 5.7% of total U.S. large motor energy consumption, 2.1% of the total U.S. industrial electrical consumption, and 0.6% of the total U.S. electrical consumption. Annual savings could amount to $1.1 billion in energy cost savings, and 15.5 million tons of CO_2 emissions from power generation.

PEC has successfully commercialized low HP motor controller technology up to 600 VAC and 200 HP, with an installed base more than 3500 units worldwide. PEC is extending the capability of this commercial platform to 2300-4600 VAC.

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